REMARKS

Claims 1 is currently pending in the above-identified patent application, claims 22-50 having been cancelled by this amendment.

Examination has been limited to SEQ ID NO:41 as indicated.

Claim 1 was rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,242,568 to Barbas et al. ("Barbas et al. '568").

Reexamination of the application as amended, reconsideration of the rejections, and allowance of claim 1 are respectfully requested.

The three-month shortened statutory period for response expires on December 28, 2005. Accordingly, this response is being filed in a timely manner.

I. AMENDMENTS TO THE APPLICATION

Entry of the amendments to the claims is respectfully requested. As detailed below, these amendments introduce no new matter.

The amendment to claim 1 is supported by Figure 1 of the above-identified patent application. This figure lists the binding specificity of each of the zinc finger nucleotide binding domains referenced in the application by their SEQ ID NOs.

This amendment is proper after final action under 37 C.F.R. § 1.116, because it places the claim in better form for allowance or consideration on appeal, it raises no new

issues, and it does not require a new search. Therefore, entry of this amendment to claim 1 is respectfully requested.

Claims 22-50 are canceled by this amendment. The cancellation of these claims is without prejudice to the filing of a properly copending divisional, continuation, or continuation-in-part application directed to the subject matter of any or all of these claims.

The Office Action stated that claims 22-50 were drawn to zinc finger proteins comprising 2 to 12 different nucleotide binding regions selected from SEQ ID NOs: 1-110 and that only SEQ ID NO: 41 had been searched in the previous Office Actions. The Office Action stated that these claims were drawn to non-elected inventions. Accordingly, to advance prosecution, these claims are cancelled.

II. THE REJECTION UNDER 35 U.S.C. § 102(b)

Claim 1, directed to SEQ ID NO: 41, was rejected under 35 U.S.C. § 102(e) as anticipated by U.S. Patent No. 6,242,568 to Barbas et al. ("Barbas et al. '568"). This rejection is respectfully traversed.

It was stated that Barbas et al. '568 taught a C7 zinc finger nucleotide binding polypeptide containing SEQ ID NO: 41 (KSADLKR) in Figure 15 and in SEQ ID NO: 42 of Barbas et al. '568 at residues 20-26.

This rejection is respectfully traversed because the teachings of Barbas et al. '568 do not establish that "the nucleotide-binding activity of the polypeptide resides in the nucleotide-binding region having the sequence of SEQ ID NO:41" as required by pending claim 1. The C7 zinc finger nucleotide binding polypeptide of Figure 15 of Barbas et al. '568 (SEQ ID NO: 42 of Barbas et al. '568) seemingly has three repeats of the motif Lys-Ser-Ala-Asp-Leu-Lys-Arg (KSADLKR) at amino acids 20-26, 50-56, and 80-86.

However, at column 29 of the specification of Barbas '568, it states that the C7 finger can be constructed according to the scheme:
MKLLEPYACPVESCDRRFSKSADLKRHIRHTGEKP-
(YACPVESCDRRFSKSADLKHIRIHTGEKP)$_{1-11}$, (SEQ ID NO: 39) where the sequence of the last linker is subject to change since it is at the terminus and not involved in linking two fingers together (column 29, lines 56-64 of Barbas '568). In this scheme, the third repeat of the motif Lys-Ser-Ala-Asp-Leu-Lys-Arg (KSADLKR) is not exact and is in fact Lys-Ser-Ala-Asp-Leu-Lys-His (KSADLKH). It is this protein, with the imperfect third repeat, that is described as binding the designed target sequence GCG-GCG-GCG (SEQ ID NO: 32 of Barbas et al. '568) in an oligonucleotide hairpin with an affinity of 9 nM, as compared to an affinity of 300 nM for an oligonucleotide encoding the GCG-TGG-GCG sequence (Barbas et al. '568, column 29, line 64 to column 30, line 3).

Moreover, claim 1, as amended, recites that the zinc finger nucleotide binding region binds a nucleotide sequence selected from the group consisting of GAC, GTC, GCT, and GCC. None of these nucleotide sequences is bound by the protein recited in Barbas '568, whose binding specificity is defined above. The results of Barbas '568 suggest that the Lys-Ser-Ala-Asp-Leu-Lys-Arg (KSADLKR) motif and the inexact repeat of that motif, Lys-Ser-Ala-Asp-Leu-Lys-His (KSADLKH), found in the protein described in Barbas '568, bind the triplet GCG. This is because it is known that when a zinc finger nucleotide binding protein binds a nucleic acid sequence, the amino-terminus of that zinc finger nucleotide binding protein binds to the 3'-end of the nucleic acid sequence and the carboxyl-terminus of that zinc finger nucleotide binding protein binds to the 5'-end of the nucleic acid sequence. Therefore, according to the results of Barbas '568, the sequences KSADLKR or KSADLKH bind to the triplet GCG, and not to TGG. These results follow from the placement of these motifs in the zinc finger protein described in Barbas '568.

The less-specific binding results seen when the middle triplet is changed from GCG to TGG indicates the sensitivity of the binding to the three-dimensional structure of the

nucleotide. It also indicates that the binding can be greatly affected even when the triplets that bind the zinc finger nucleotide binding domains that are amino- or carboxyl-terminal to the mismatched domain should still be bound. Therefore, it is necessary to take into account the entire three-dimensional structure of a zinc finger nucleotide-binding polypeptide to determine its binding specificity for a particular nucleotide sequence. As emphasized below, this shows that the zinc finger nucleotide-binding polypeptide of Barbas '568 and the zinc finger nucleotide-binding polypeptide of claim 1 of the present invention are different molecules.

Accordingly, because of the different binding specificity for KSADLKR in the zinc finger protein described in Barbas '568, there is no disclosure in Barbas '568 of a zinc finger binding protein "that consists essentially of a nucleotide binding region having the sequence of SEQ ID NO:41 such that the nucleotide-binding activity of the polypeptide resides in the nucleotide-binding region having the sequence of SEQ ID NO:41 and wherein the nucleotide-binding region having the sequence of SEQ ID NO: 41 binds a nucleotide sequence selected from the group consisting of GAC, GTC, GCT, and GCC" as required by claim 1 as amended.

A rejection under 35 U.S.C. §102 requires that the claimed subject matter be described in its entirety in a single reference. Kalman v. Kimberly-Clark Corp., 218 U.S.P.Q. 781, 789 (Fed. Cir. 1983), cert. denied, 465 U.S. 1026 (1984). In re Marshall, 198 U.S.P.Q. 344 (C.C.P.A. 1978). Missing elements cannot be supplied by the knowledge of one skilled in the art or by the disclosure of another reference. Structural Rubber Products Co. v. Park Rubber Co., 223 U.S.P.Q. 1264, 1271 (Fed. Cir. 1984).

Moreover, the properties and activity of a compound, such as the zinc finger binding polypeptide of claim 1, must be considered as an inseparable part of the compound for the consideration of patentability. In re Papesch, 137 U.S.P.Q. 43 (C.C.P.A. 1963). This means that the lack of specific binding of any of the triplets GAC, GTC, GCT, and GCC by

the zinc finger nucleotide binding polypeptide described in Barbas '568 precludes any anticipation of claim 1 by Barbas '568.

The preamble "consisting essentially of" or equivalent language limits the scope of a claim to the specified materials or steps "and those that do not materially affect the basic and novel characteristics of the claimed invention." In re Herz, 190 U.S.P.Q. 461, 463 (C.C.P.A. 1976). The preamble "consisting essentially of" is not equivalent to "comprising." Claims using the transitional phrase "consisting essentially of" are properly considered to be partially open rather than open. In re Garnero, 162 U.S.P.Q. 221, 223 (C.C.P.A. 1969). The existence of other nucleotide binding regions in the polypeptide of Figure 15 of Barbas '568 does affect the "basic and novel characteristics" of the claimed invention, as the activity of these polypeptides resides in their specific binding of nucleotide sequences. This is emphasized by the difference in binding specificity between the polypeptide of Barbas '568 and the polypeptide of claim 1 of the pending application. This different binding specificity indicates that the "basic and novel characteristics" of the polypeptides are different, as the binding specificity for nucleotide sequences is the entire function of these zinc finger polypeptides. Thus, the polypeptide of Barbas '568 cannot anticipate claim 1 of the pending application.

The use of this transitional phrase, therefore, precludes the possibility of a rejection under 35 U.S.C. § 102(e) over Barbas '568. The rejection over Figure 15 of Barbas '568 is over a polypeptide that contains a framework that affects the ability of the protein to bind the required nucleotide sequences. It is a well-understood principle of protein structure that the secondary and tertiary structure of a protein is directly specified by the primary structure of the protein. The ability of an amino acid sequence to act as a zinc finger motif and bind a specified triplet is therefore highly dependent on the secondary and tertiary structure of the protein. The zinc finger proteins of Barbas '568, including that of Figure 15, are provided by minimal modification of the wild-type zinc finger proteins Zif268.

In contrast, the zinc finger polypeptides of the present invention are derived by modular assembly and are not directly related to Zif268 in their primary sequence. This means that the secondary and tertiary structures of the proteins differ significantly. This difference in secondary and tertiary structures undoubtedly is the reason for the difference in binding specificity between the zinc finger polypeptides of claim 1 of the present invention and the zinc finger polypeptides described in Barbas '568.

The application of this principle of protein chemistry meets the burden of showing that the introduction of additional components would materially change the characteristics of applicant's invention. In re De Lajarte, 143 U.S.P.Q. 256 (C.C.P.A. 1964). It clearly would, based on the actual difference in binding specificity. This is a material change in characteristics, because the most significant property of such zinc finger polypeptides is their ability to bind a specific nucleic acid sequence, such as a triplet.

Accordingly, the Examiner is respectfully requested to withdraw this rejection and allow claim 1.

IV. OTHER MATTERS RAISED IN THE OFFICE ACTION

It was stated that the Information Disclosure Statement filed April 17, 2002 did not have a PTO-1449 forms attached or references attached. The PTO-1449 forms associated with the Information Disclosure Statement were transmitted on November 14, 2005. Copies of the references are not required to be furnished pursuant to 37 C.F.R. § 1.98(d). The requirements of 37 C.F.R. § 1.98(d)(1) and (2) are met for dispensing with the requirement to provide copies of these references, as the earlier patent applications are identified in the Information Disclosure Statement and are also relied upon for priority under 35 U.S.C. § 120.

V. CONCLUSION

In conclusion, claim 1 is patentable over the prior art of record, whether considered individually or in combination. Accordingly, prompt allowance of this claim is respectfully requested.

If any issues remain, the Examiner is respectfully requested to telephone the undersigned at (858) 200-0581.

Respectfully submitted,

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